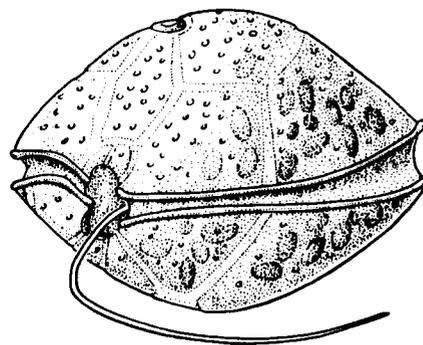


## CIGUATERA FISH POISONING IN THE PACIFIC

### Workshop: Fish poisoning and seafood toxicity

A ciguatera workshop on fish poisoning and seafood toxicity was held during the Twentieth Regional Technical Meeting on Fisheries. Following presentation of the various factors involved, by well-known experts, the participants visited the ORSTOM laboratories in Noumea, where they were given demonstrations of the ciguatera poke-stick test, shown *Gambierdiscus toxicus* algae and a video on ciguatera research in Australia.



*Gambierdiscus toxicus*  
(Magnified 450 times)

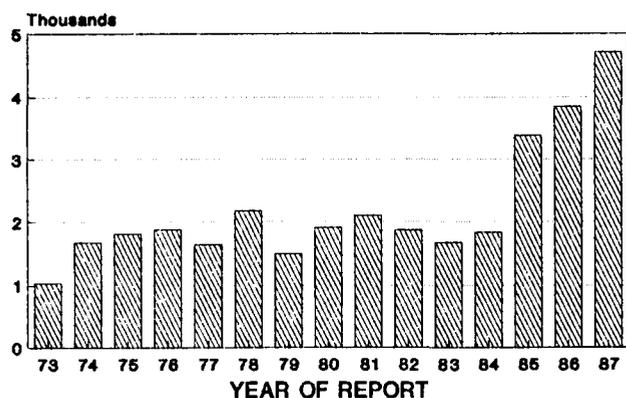
The following recommendations arose from the discussions:

- that the poke stick test be evaluated by appropriate laboratories in the Pacific area using a combination of animal bioassay procedures on proven toxic and non-toxic fish samples (e.g. the Institut de recherches médicales Louis Malardé in Tahiti, and the Queensland Department of Primary Industries Southern Fisheries Research Centre).
- that, in consultation with appropriate regional health and fisheries experts, the SPC Health and Fisheries programmes compile a concise practical manual to aid the clinical diagnosis of various types of fish poisoning in the SPC region. Such a manual should be accessible to both Fisheries and Health personnel.
- that the SPC Secretariat encourage and support national programmes to improve the diagnosis and formal notification of instances of fish poisoning. The meeting recognised that this action would require close collaboration between regional and national health and fisheries authorities.

### Ciguatera as a health problem

In the course of the workshop, Dr Steve Terrell-Perica, SPC Health Services Epidemiologist, gave an overview of the epidemiology of ciguatera in the region, and noted it as a very important health problem, as well as one that involves fishery economics and development. The Health Services Epidemiologist particularly emphasised the importance of monitoring the extent of fish poisoning and surveillance to identify outbreaks and transient poisoning incidents.

### FISH POISONING CASES REPORTED TO SPEHIS - 1973 TO 1987



Ciguatera fish poisoning is a significant public health problem in the Pacific and a potential barrier to further development of small-scale commercial fisheries in the Pacific islands. In recent years, as shown in the attached figure, over 3,000 cases of fish poisoning have been reported annually to the South Pacific Epidemiological and Health Information Service (SPEHIS). It is estimated that this total represents only 10/20 per cent of the actual number of cases of fish poisoning, which would therefore be in the order of 15,000 to 30,000 cases annually. Though death from ciguatera fish poisoning is rare, illness can be severe and recovery slow.

Publicity on cases of fish poisoning can result in a decline in the consumption of fresh fish in island communities and problems in exporting fresh fish to foreign markets.

Fish poisoning can result from eating spoiled fish or from eating fresh or processed fish containing naturally occurring toxic substances. Ciguatera fish poisoning results from eating reef fish that have previously consumed toxic dinoflagellates (microscopic marine organisms) or from eating predators of these reef fish. There are several types of fish poisoning in addition to ciguatera. Some types are associated with specific fish, such as puffer fish poisoning. Scombrotoxic fish poisoning occurs when certain types of fish (mackerels and tunas) are eaten after they produced toxins through spoilage, usually because of inadequate chilling and refrigeration.

### **Clinical symptoms and treatment**

The major clinical symptoms that have been associated with ciguatera fish poisoning include: numbness of limbs, tingling around the mouth, temperature reversal (where hot feels cold and vice versa), joint and muscle pain, diarrhoea, and general weakness. Symptoms usually appear within 2 to 30 hours, with an average of about 6 hours, after the consumption of toxic fish, and may vary with the individual and the species, the quantity and parts of the fish consumed. Usually the first symptoms to appear are numbness with a prickling sensation around the lips, tongue and throat, and general weakness and nausea.

There seems to be a dose-response relationship in ciguatera fish poisoning, with increased ingestion of toxic fish causing more severe symptoms. The illness may last for weeks or months, and occasionally years, depending on the severity of the symptoms. Repeat cases are usually more severe.

Death from ciguatera fish poisoning occurs in less than 1 per cent of the cases from respiratory and heart failure, and shock from severe dehydration due to vomiting and diarrhoea.

In most cases, people with ciguatera fish poisoning recover completely and treatment of the symptoms is usually sufficient. Mannitol, an inexpensive sugar compound widely used to help the flow of urine, may be an effective treatment for acute ciguatera fish poisoning. Mannitol may work by flushing out fish poisoning toxins from the body through the urine. Studies to confirm the effectiveness of mannitol are in progress.

### **Causative agent of ciguatera fish poisoning**

Ciguatera fish poisoning is associated with several polyether toxins, of which ciguatoxin is probably the most important (especially in carnivorous fish). Toxic *Gambierdiscus toxicus* is the source of introduction of ciguatoxin into the food chain, leading to human fish poisoning. These dinoflagellates attach themselves to marine algae and are then passed up the food chain by being consumed by small herbivorous fish, which are then consumed by carnivorous fish. Humans are poisoned after consumption of either type of toxic fish.

Ciguatoxin is one of the most potent and stable marine toxins known. It is resistant to heat and acid, and cannot be destroyed by cooking, smoking, marinating, freezing, drying, salting or freeze drying. In addition, ciguatoxin and other related toxins do not alter the smell, taste or colouration of the toxic fish tissues.

The ciguatoxin concentrates in the liver, viscera, organs, roe and head of the fish, which feel no ill effects from the toxin. The higher fish are in the food chain, the more concentrated is the toxin in their tissues and the more severe the symptoms from eating the fish. In the Pacific the majority of the implicated fish are reef fish that are carnivorous, with affected species varying from area to area.

### South Pacific Commission activities on ciguatera

The SPC Epidemiology programme published a handbook on fish poisoning in the Pacific in 1973 and organised meetings of the Expert Ciguatera Committee in 1981 and 1983. In addition the SPC South Pacific Epidemiological and Health Information Service (SPEHIS) publishes regular reports of cases. The Epidemiology programme's input in the ciguatera workshop held during the Twentieth Regional Technical Meeting on Fisheries represents an attempt to consider side by side the health and economic aspects of the problem.

### REGIONAL TRAINING COURSE ON DRUG IDENTIFICATION AND CONCEALMENT METHODS

The Seventh South Pacific Commission Regional Training Course on Drug Identification and Drug Concealment Methods was held in Pago Pago, American Samoa, from 22 August to 2 September 1988. It was attended by 43 Senior Custom and Police Officers from 16 countries in the region.



The training covered a wide range of subjects in the control and policing of illicit drugs. The subjects covered included research on profiling the 'high risk' user in the Pacific, multi-agency approach to fighting the drug abuse problem, drug identification, methods of concealment, cannabis and its derivatives, cocaine and its derivatives, paraphernalia of the drug user, use of drug testing equipment, vulnerable areas, forfeiture, interrogation, raid planning, arrest techniques and search of buildings.

The training consultants were from the Custom and Police Services of the United States of America, Australia and New Zealand, and from the Drug Administration Authority (DEA) of the United States. The two-week training course was organised and directed by the Commission's Health Education Specialist, Mr Manoa Bale, and was jointly co-ordinated by Mr Bale and the Department of Public Safety of American Samoa.